SNC2D3 - Homework from Monday, November 7th - page 511 #1-8

1. Use a Venn diagram to compare a telescope with a microscope.

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| **Kepler’s Telescope** | **Both** | **Microscope** |
|  | **-2 convex lenses** |  |
|  | **-objective lens + eyepiece** |  |
| **used for viewing very distant objects** |  | **used for viewing very small specimens** |

2. Use a Venn diagram to compare the liquid lens in Figure 12.1 on page 487, with the human eye in Figure 12.23, on page 506.

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| **Liquid Lens** | **Both** | **Eye** |
| **-has 2 layers of liquids with different indices of refraction** | **-have 2 layers of refractive material** | **-has cornea & lens, which have different indices of refraction** |
| **-shape of surface between liquids is adjusted using power source to adjust focus** | **-can focus on objects of varying distances without moving the lens** | **-shape of lens is adjusted by ciliary muscles to adjust focus** |

3. Suppose that you are examining a fly under a microscope, as shown in the diagram on the right. Copy the diagram into your notebook, and show the fly's approximate image size and location. Use figure 12.21 as a reference.

**-A virtual (inverted, larger) image will be formed behind the specimen.**

4. Describe two examples of lens technologies that benefit society.

**-Many…telescopes, microscopes, binoculars, etc…**

5. In the human eye, the distance between the lens and the retina does not change. Explain how the lens can focus images of both distant objects and nearby objects on the retina.

**-The ciliary muscles adjust the shape of the lens depending on the distance of the object observed so that it is in focus.**

6. The following are components of a camera: aperture, film or CCD, ring that moves the lens in and out. Explain what their function is and what part of the eye carries out a similar function.

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| --- | --- | --- |
| **aperture** | **controls the amount of light that enters the camera** | **pupil** |
| **film of CCD** | **light-sensitive material** | **retina** |
| **ring** | **moves the lens in and out to focus on objects at difference distances** | **ciliary muscles** |

7. Explain how night-vision devices amplify the amount of available light. Include a simple diagram.

**-The front lens focuses the small amount of available light on the photocathode, which emits electrons where the light hits it, then the microchannel plate amplifies the number of electrons, then the electrons collide with a plate coated in phosphor, which emits green light.**

8. The diagrams on the right show two eyes. One eye has normal vision and the other eye has defective vision. Identify the eye that has defective vision. Explain why you chose it, what you think the defect is, and how it can be corrected.

**-A appear to be the one with defective vision because the cornea is the wrong shape, which is what occurs in astigmatism. This could be corrected with laser eye surgery or corrective lenses.**